City of Wichita Public Works and Utilities

Utilities Optimization Program

Appendix F

Northwest Water Treatment Plant Value for Money Analysis

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Submitted to:

CITY OF WICHITA

Public Works and Utilities

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In Association with:

TRC TABLE ROCK CAPITAL®

Goldman Sachs

Appendix F—Northwest Water Treatment Plant Value for Money Analysis

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1.0 Introduction

In support of the City of Wichita (the City) Public Works and Utilities Department (the Utility) Water Production and Pumping and Water Distribution Divisions (Water Utility) and Sewer Maintenance and Sewage Treatment Division (Sewer Utility) with its implementation strategy for the Water and Sewer Utilities optimization program, a Value for Money analysis (VfM) was prepared by CH2M HILL Engineers, Inc. (CH2M) together with its teaming partners Table Rock Capital and Goldman, Sachs, and Company (Goldman Sachs). A VfM is a generally accepted best practice for evaluating projects of $100 million or greater in value, where the project's scale and complexity warrant a thorough evaluation of potential life-cycle value and risk advantages and disadvantages of project technology and delivery. The purpose of the VfM analysis, generally, is to accomplish the following:

- Determine the most advantageous project technology and delivery method on a comparative life-cycle cost basis
- Serve as a standard analytical method for the City's future use in evaluating similar major infrastructure investments

This VfM is a life-cycle cost analysis that includes the cost and performance assumptions of public and public-private delivery including risk sharing over the life of a project, which can also be understood as a contractual transfer of accountability to project delivery partners. Factors evaluated include upfront project delivery cost and schedule certainty; relative cost, flexibility, timing and risk transfer attributes of financing sources; and ongoing cost and performance certainty through the operations service phase, including preventive vs. reactive maintenance practices.

It is important to highlight that this VfM is only intended to serve as a focused alternative analysis that compares selected delivery methods for the water treatment plant (WTP) project described below. It was prepared by CH2M in its role as the optimization program consultant, together with Table Rock Capital and Goldman Sachs. While this VfM only comprises of a comparison of two delivery models due to presentation simplicity and the assumption that these two delivery options are the two ends of the anticipated delivery spectrum, a complete description of additional delivery options available to the City is provided in Attachment A, Alternative Delivery Methods.

CH2M, Table Rock Capital, and Goldman Sachs are not acting as municipal advisors as per Section 15B of the Exchange Act[1] with respect to the information and material contained in this VfM. The City has separately retained an independent registered municipal advisor that is providing them with advice on issuance of municipal securities and financial products.

2.0 Project Description

The City's existing WTP was identified for potential improvements not due to capacity or regulatory requirements but due to the age of the facility and concerns regarding a lack of redundancy in the City of Wichita's water treatment system. Supplementing the existing WTP with a new Northwest WTP (NW WTP) was first anticipated by the Utility in its capital improvement program (CIP) planning beginning in 1993, and the need for both upgrade and redundancy has increased in the 24 years following.

The existing WTP has major treatment components which are 75 years old. While it has served the community well, the asset condition assessment found that many WTP assets have reached the end of their useful life and are in need of immediate replacement. In addition, there are operational and maintenance efficiencies which can be gained by employing the latest treatment technologies. A significant area of concern is the single point of failure potential associated with relying on one 75-year-old WTP to continuously serve the 665,000 residents of Wichita.

Based on the Water Treatment Business Case Evaluation (BCE) dated February 28, 2017, prepared by CH2M in collaboration with City staff using the Utilities Optimization Decision Support Tools (DST), it was concluded that a new 120-million gallons per day (MGD) NW WTP be recommended for delivery on a priority basis.[2] The development of this new facility was deemed most promising in terms of reliability, operations and maintenance (O&M) costs and risks, construction expediency, and technology characteristics, and is considered more attractive than other technology and/or rehabilitation solutions. A new treatment facility could be constructed and started with minimal interruption to existing operations. In addition, two WTPs would ultimately be available to provide treated water supply redundancy, significantly reducing the current single-point of failure risk described above.

The new NW WTP would be constructed on a greenfield site and would consist of softening treatment utilizing either conventional or advanced technologies and capable of treating both 100-percent groundwater and/or surface water. Lime softening solids would be conveyed and treated as they are now, but the conveyance distance is shorter.

It is anticipated that the City's existing WTP would be improved following construction of the new NW WTP. The advantage of this construction sequence is that the existing WTP could be taken offline following completion of the NW WTP, reducing the substantial construction costs and risks of tie-ins, shut-downs, and maintaining continuous operations at the existing WTP through its upgrade.

3.0 Project Delivery Methods Evaluated in this Value for Money Analysis

As previously noted, while this VfM only comprises of a comparison of two delivery models due to presentation simplicity and the assumption that these two delivery options are the two ends of the

[1] Section 975 of Title IX of the Dodd-Frank Wall Street Reform and Consumer Protection Act amended Section 15B of the Securities Exchange Act of 1934 ("Exchange Act") to require municipal advisors to register with the Securities and Exchange Commission, effective October 1, 2010.

[2] CH2M HILL Engineers, Inc. 2017. *Water Treatment Business Case Evaluation for City of Wichita, Water Production and Pumping Division*. February 28.

anticipated delivery spectrum, a complete description of additional delivery options available to the City is provided in Attachment A, Alternative Delivery Methods, including the primary advantages and disadvantages of each method. VfM methodology classically contrasts the design-build (DB) delivery/finance method to the design-build-finance-operate-maintain (DBFOM) delivery/finance method. For this VfM analysis, the following two project delivery options are evaluated:

- DB
- DBFOM (also known as Public-Private-Partnership or P3)

In its May 2015 Request for Proposal (RFP) for Water and Sewer Utilities Optimization (pursuant to which this VfM analysis was conducted), the City stated that it "…will not forfeit any governance of the utility and will retain ownership over the assets, rate structure and operations." In addition, the City noted that it "…was open to exploring different management structures, including models of joint decision making between the City and the proposing firm" and desired "the selected firm provide access to new capital that provides more advantageous financing costs to the City." The project delivery methods evaluated for the proposed project are measured against criteria that include these stipulations.

In general terms, the DB method offers an alternative delivery approach that primarily transfers change order and delay risk during construction to the DB partner through a lump-sum contract. Traditional issuance of low cost tax-exempt municipal debt is the presumed financing source. However, additional financing from a range of sources as discussed in Appendix D, Water and Wastewater Financial Report (Financial Report), including subordinate debt, federal Water Infrastructure Finance and Innovation Act (WIFIA) financing, and State Revolving Loan Funds (SRFs) are available to expand the Utility's debt capacity should the capacity be needed. Risk transfer to the DB partner typically ends with acceptance testing and the close of the 1-year warranty period post-construction. Design Build is becoming a more commonly practiced delivery method among municipalities, and is proving advantageous over the historic convention of design-bid-build (DBB), where the public entity typically retains all change order and delay risk.

The second method evaluated, DBFOM, also allows the City to retain ownership over the assets and control of rate setting, with no displacement or transfer of existing staff to private employment required. In contrast to DB, the DBFOM integrates and transfers ongoing operational performance accountability over the life of the agreement to a private partner, in addition to transferring the change order and delay risk during construction. The DBFOM project company becomes, essentially, a partner on behalf of the City in running all contractual terms to ground with the DB provider as well as the operations service phase providers. DBFOM provides alternative financing from a range of sources as discussed in the Financial Report, including options with tax-exempt Private Activity Bonds, federal WIFIA financing, State Revolving Loan Funds, and accelerated 4(2) Private Placement and 144(A) buy-and-hold infrastructure investors. Additionally, the Financial Report defines a proven 501(c)(3) structure as an alternative that enables tax-exempt financing for the project, with some remaining risk transfer. Similar to the DB delivery approach, the DBFOM exhibits an ability to expand the Utility's debt capacity for the remainder of its CIP, however, while also absorbing performance risk over the 30-year term of the financing.

3.1 Design-Build Delivery

Under the DB delivery, the design and construction tasks are combined and performed by a single contractor or team instead of being completed by separately contracted teams. The delivery requirements can either be fixed-price DB (FPDB or prescriptive) or progressive DB (PDB). Under a PDB, the City specifies detailed requirements such as the WTP layout, equipment, and sequencing. Under a performance-based PDB, the City defines specific outcomes that must be met, but the contractor has flexibility in the design and construction to achieve the specified performance requirements and

negotiates final price based on an open book process with the DB partner. This VfM assumes a FPDB (prescriptive) project delivery approach.

The DB delivery method can provide both cost and schedule efficiencies relative to a traditional DBB delivery. Cost savings can be found through multiple sources including reduced design effort, minimized construction change orders, and value engineering. The schedule efficiencies are gained through the simultaneous execution of portions of the design and construction work, thus avoiding two procurement processes—one for the designer and one for the construction contractor. Following successful startup, the City would operate and maintain the project.

3.2 Design-Build-Finance-Operate-Maintain Delivery

A DBFOM delivery integrates the design, construction, financing, and operations of the project under a single contract with a private partner. The private partner would work in close collaboration with the City to specify performance outcomes, and finance, design, and construct the project to those mutually agreed upon specifications, and then maintain the project through its operations service phase to meet the performance specifications and overall agreed upon life-cycle business plan. A Progressive DBFOM process could be used to launch the design engineering and costing development of the new NW WTP. The City retains ownership, and the facility must be maintained to a specified condition for handback at the end of the agreement. The term of DBFOM agreements typically mirrors the term of the financing, with 30- to 40-year terms customary.

The private partner is typically compensated for the design, build, finance, operations, and maintenance scope on a performance basis, in the form of a fixed availability payment on a monthly or quarterly basis. If performance specifications are met, then the availability payment to the private partner occurs. Certain variable commodity-per-unit costs may be most cost-effectively treated as pass-throughs at cost, such as energy, while performance commitments capping or reducing total unit use may be incorporated to incentivize efficiencies. At the end of the operations service phase, handback standards and requirements govern the condition of the WTP as it transfers back to standard city operations.

3.3 Project Assumptions

A number of estimates and assumptions are used in the creation of the VfM analysis. This section describes the assumptions for the project duration, construction costs, operating costs, and financing costs for the two procurement methods.

3.4 Project and Construction Duration Assumptions

A 30-year study period has been used to conduct the VfM analysis. Two primary considerations were used in identifying this period. The normal lifespan for major mechanical process equipment is typically 30 years, which is a likely timeframe for a private delivery arrangement if a DBFOM approach is selected. In addition, as detailed later in this memorandum, 30 years is a reasonable financing timeframe for either a public or private delivery option.

The construction duration includes design, construction, and startup and commissioning of the WTP. The construction duration differs based on the delivery method for the new facility.

3.4.1 Design-Build

The construction duration is estimated to be 5 years based on conventional lime softening technology. The design and construction phases are combined and performed by a single contractor or a split-risk joint-venture entity.

3.4.2 Public-Private Partnership

The construction duration is conservatively estimated to be 5 years based on high-rate lime softening technology, though if implemented, the project company would pursue rigorous contractual commitments to a 4-year delivery. Like the DB delivery, the design and construction phases are performed by a single contractor or split-risk joint venture, and are combined.

3.5 Construction Costs

The construction cost for the two procurement methods are discussed below. The construction costs were developed using CH2M's Parametric Cost Estimating System (CPES). CPES seamlessly integrates the three main conceptual components of early project planning—facility design, construction cost estimating, and life-cycle cost estimating. It is a proprietary conceptual design and cost-estimating tool that generates quick, accurate, and detailed cost estimates at the conceptual stage of infrastructure investment.

CPES modeling was applied consistently across the alternatives. While the estimates are planning-level and as such have an accuracy of +50 percent to -30 percent, the margin of error is consistent across alternatives and therefore reliable for comparison purposes. The construction costs below are in current cost dollars and do not include cost escalation over the construction duration.

3.5.1 Design-Build

The capital cost under the DB delivery is estimated at $380 million. The DB alternative assumes the use of a conventional lime softening plant. The capital cost assumes efficiencies gained by integrating the design and construction tasks, with joint accountability, under one contract.

3.5.2 Design-Build-Finance-Operate-Maintain

The capital cost under the DBFOM delivery is $316 million, approximately 17 percent below the cost of the DB delivery. The lower capital cost is due to the combination of the DB advantages of combined DB tasks and risks, the integration of O&M expertise in the development phase, and to the use of a more efficient treatment technology made possible through the transfer of design and operations risk to the expertise and enforceable accountability of a private partner. It is assumed that the DBFOM partner would use a high-rate lime softening process in place of a traditional lime softening process, and would take the risk of expertly managing and maintaining that process sufficient to meet performance requirements, over the 30-year life of the agreement.

3.6 Operating Costs

The following section discusses the expected operating costs for each delivery method. The operating costs are based on CH2M's operating cost models and City-specific operating conditions and were applied consistently across both alternatives.

3.6.1 Design-Build

Based on currently available information on water demand projections provided in the City of Wichita Water Demand Assessment,[3] an average annual operating cost estimate of $19.8 million is expected for DB delivery (current cost dollars).[4] The annual operating cost includes major maintenance components. The City's overhead costs such as accounting and human resources that would support the facility are not included. In addition to O&M expenses for the new WTP, O&M expenses for the existing facility would continue while the new facility is under construction. There would be O&M expenses for the existing facility under all of the procurement options, but the longer DB procurement schedule would result in an additional year of existing WTP operations. It is assumed that the operating costs will increase at an annual rate of 3 percent.

3.6.2 Design-Build-Finance-Operate-Maintain

Under the DBFOM delivery, the annual operating costs are expected to be $17.5 million, approximately 12 percent lower than the operating costs for the DB delivery. The lower operating costs are due in part to the use of the high-rate lime softening process. In addition, and as noted in the O&M Review, deferring capital projects and pushing equipment and facilities past their useful life dramatically increases maintenance costs long term, compared to the same system under DBFOM delivery where capital reinvestment is funded and conducted proactively as equipment reaches its end of service. It is assumed that the operating costs will increase at an annual rate of 3 percent.

In additional to operating cost, there would be annual costs for the management of the P3 somewhat greater than the costs that would be left with the utility under a conventional delivery. These costs include asset management, project insurance, independent engineering, trustee management fees, and rating agency fees. It is estimated that these fees combined will be approximately $700,000 initially and will escalate at 3 percent per year.

With the proposed NW WTP being a new, greenfield facility, there are no current City staff displaced by the operations service phase (O&M) of this facility. Therefore, the VfM does not include the effects, positive or negative, of a DBFOM for a new NW WTP on City staff.

3.7 Financing Costs

The following section discusses financing assumptions for the procurement methods under consideration.

3.7.1 Design-Build

Under a DB delivery, the City would likely continue to issue revenue-backed bonds to fund the capital cost of the WTP. However, as previously mentioned, several alternative financing options are available under this delivery method.

Bond Rate and Term

An average interest rate of 3.75 percent is assumed for the municipal bond borrowing in the DB alternative. The rate is based on current market analysis by the project team. A term of 30 years is

[3] SAIC and PEC. 2013. *Water Demand Assessment Technical Memorandum*. Prepared for the, City of Wichita. August.

[4] The $19.8 million annual operating cost estimated by CH2M using CPES is significantly higher than the City's estimated $7.0 million operating cost for the existing water treatment plant. The City's current lower operating costs may reflect an under investment in maintenance activities, unfilled staff vacancies, emergency maintenance costs and/or misinterpretation of cost center accounting data and definitions. The City's Water Utility Fund does not distinguish between water treatment plant O&M expenses and other water utility related expenditures. $7.0 million was provided as an estimate for the purposes of the VfM analysis. The City's actual WTP-specific O&M expenses may be higher or lower than this estimate.

assumed to match the expected facility life. Payment of the debt will be amortized over the 30-year term. The VfM model was deliberately run with conservatively priced municipal revenue bonds because of the City's experience with this funding mechanism. However, there are additional financing options that could be considered such as subordinate lien financing, State Revolving Loan Funds, and WIFIA financing. These may have attractive terms and may reduce overall financing costs but are not necessarily guaranteed. For example, the Federal WIFIA program is newly established and becoming available with funding capacity, however, we anticipate many municipalities will consider WIFIA funding and not all municipalities will be selected to receive funding. Additional information regarding WIFIA is provided below:

- The Federal WIFIA program provides low cost loans for water projects. The interest rate for the loan is equal to the Federal cost of borrowing plus one point, currently about 3.00 percent, and can fund up to 49 percent of the total project cost. The program has been authorized and funding has been appropriated sufficient to fund an estimated $1.6 billion in projects. The first invitation to apply for funding was issued in early January 2017 and will be open until April 10th, 2017, with another window opening later in the year for remaining funds. While the WIFIA program provides attractive financing and extremely favorable repayment timing flexibility, there are certain Federal requirements and schedule considerations that may impact its overall pricing and terms.
- Additionally, there are certain credit features of a WIFIA loan, such as a springing lien in the case of non-payment event or default that could prove incompatible with the City's existing debt portfolio. This means that that in a non-payment event, the WIFIA loan will become a senior lien obligation, *pari passu* with existing senior lien revenue bonds. This would have the impact of severely limiting the amount of leverage on the program should the City not want to have its senior lien revenue bonds downgraded.

Issuance Costs

For this preliminary analysis, bond issuance costs of 1.5 percent of the borrowed amount are assumed for the DB alternative. The issuance cost is below the City's cost assumption of 8 percent. The City's assumption includes funds to capitalize the cost of funding the debt service reserve funds required for the bond issues, which typically represent the maximum year projected debt service payment. The cost of funding a reserve fund is accounted for separately and is in line with the City's assumptions.

3.7.2 Design-Build-Finance-Operate-Maintain

Borrowing Rate and Term

The capital cost for private finance has traditionally been higher than financing available through the municipal bond market in part due to tax exemption for traditional revenue bonds. However, a number of factors have combined to reduce or eliminate the difference in cost of capital. First, the spread between taxable and tax exempt has narrowed or on occasion reversed in the years since the 2008-2009 recession. Second, federal policy favoring the use of P3 has resulted in a number of alternative financing options now available under a DBFOM structure, including tax-exempt private activity bonds and WIFIA loans. Finally, a short supply of attractive infrastructure investment opportunities in the United States has created a backlog of private capital seeking well-structured project investments. At this time, creditworthy DBFOMs are in a seller's market that results in both debt and equity sources competing at the time of pricing, thus driving down the overall blended cost of capital for private projects.

For this VfM analysis, funding for the project is a mix of 90 percent debt and 10 percent equity. A number of sources of debt were considered for this analysis including subordinate lien taxable bonds, subordinate lien AMT taxable private activity bonds, and loans under the Federal WIFIA program, and these are described as follows; availability of WIFIA funding for a DBFOM provides the potential for

additional cost savings to the City, while the relative ease and acceleration of a private placement approach is also examined comparatively:

- A limited quantity of private activity bonds is allocated to each state every year for financing of projects with public benefit that have a private financing component. Kansas received an allocation of $305 million for 2017. The program is administered by the Kansas Department of Commerce and the project team is in conversation with administrators about a potential partnership with the City. $100 million of private activity bonds are used in the VfM model base case with an assumed interest rate of 4.5 percent.
- Subordinate lien taxable bonds would have an interest rate of approximately 5.5 percent and are assumed to make up two-thirds of the debt in the base case for this VfM. This financing option can have certain beneficial features such as a delayed debt draw, which would reduce the effective cost of financing below the headline rate (since interest expenses in the early period would be based only the amount of debt drawn at the time, not the total amount available). As such, the delayed debt draw would be especially valuable in in enabling the City and its delivery partner to reduce interest expense during the construction phase, thereby reducing the amount of capitalized interest needed.
- The Federal WIFIA program may also be used in a DBFOM delivery. Certain features of a WIFIA loan such as a springing lien in the case of default may make it difficult to utilize WIFIA in a traditional municipal financing that is done through revenue bonds on the City's balance sheet, but would present no challenges to the City's existing debt portfolio in a DBFOM project financing. This is because the springing lien pushes the WIFIA loan to the top of the capital structure for the DBFOM special purpose entity that finances the project (not the City). As such, this has the effect of insulating the City's revenue bonds from the springing lien and could therefore provide additional savings to the City under a DBFOM relative to the base case presented here.
- The SRF could similarly provide a favorable source of capital as part of a DBFOM financing. Historically, the maximum SRF loan in Kansas has been limited relative to the size of this project. However, the project team contains national experts who have worked with SRF programs in other states to leverage available SRF resources and expand the program's financing capacity. The project team proposes to explore this opportunity to secure a larger SRF loan as part of a DBFOM financing for the project. This would provide significant savings to the City relative to the base case presented here.

The performance of DBFOM delivery is generally attributed to the at-risk equity and the interests of its at-risk lenders. The project company is the first to lose money if performance commitments are not met as agreed upon over the life of the agreement, and its lenders have no recourse to the City if the project is not performing. As a result, equity's first loss capital serves as an essential security to debt holders as well as to the City, equity returns are known and fixed for the life of the agreement, and would depend on the specific nature and degree of risk transfer in the contractual arrangements that define the DBFOM, and competitive market conditions at financial close. For the purposes of the VfM, equity is conservatively assumed to have a target return of 15 percent, but this would vary likely downward.

Based on the indicative capital structure discussed above, the weighted average cost of capital (WACC) is conservatively estimated at approximately 6 percent. The performance savings and value of risk transfer over the 30-year term is calculated in the DST, and weighed against the WACC to calculate the net value for money. The 30-year term is consistent with the estimated service life of most facilities that would be developed, and the anticipated financing term. It also is consistent with the term assumed for the traditional public delivery and finance option.

Issuance Costs

It is assumed that there are no direct issuance costs for the City associated with the private delivery and finance option. Since the DBFOM delivery would be a direct negotiated arrangement between the City and a private team for the full value of the term with the private partner expected to provide capital financing, there would be no need for the City to hire an underwriting team to sell shares related to financing or secure a credit rating for transaction.

The DBFOM partner will incur expenses in structuring the project that are recovered through the availability payment, assuming all performance commitments continue to be made. These expenses include a structuring fee, expenses for counsel and experts, and the debt arranger fee and are included in the VfM model.

Payment Structure

It is assumed that the City will make progress payments to the DBFOM partner throughout the construction period if the project proceeds on schedule and on budget. Once the new WTP is online, fixed-availability payments, with certain agreed upon hard costs escalated for inflation, will begin. The fixed-availability payments will continue for the life of the partnership as long as the DBFOM partner continues to meet performance specification.

3.8 Risk Transfer and Cost Reduction Opportunities

A preliminary identification and screening of potential risk transfer considerations that would be relevant for the WTP was conducted, with associated gains in performance accountability and cost reduction discussed. Specific categories of risk and accountability are most advantageously and cost-effectively transferred to those parties best positioned to manage them. By contrast, making a party accountable for a risk they are not positioned to manage is not cost effective. For example, making a private partner take the risk on what the unit price of electricity will be for 30 years would require an inefficient hedge in their compensation. Commodity risks like this are most efficiently priced on an at-cost pass-through basis. By contrast, transferring the risk of managing the total usage of electricity, a risk the private partner is well positioned to manage, can deliver cost reductions effectively. Putting design and operations risk on the private partner to manage makes sense and reduces overall cost and likelihood of failure, while addressing force majeure risk through the insurance provider is customary. This process of identifying and appropriately allocating risks and accountability on an open book basis results in the DBFOM agreement. The potential risk transfer factors considered in this VfM include the following:

- **Capital cost certainty (e.g., bid climate uncertainty, planning, scope creep; also appropriateness of design to the capacity of the party operating and maintaining it)—** Risk that capital cost will exceed the initial estimate as a result of higher bids than estimated and change orders during project delivery/execution. Design risk that the capital project as designed can be run and maintained to perform as specified.
- **Cost of borrowing uncertainties—**Risk that interest rates for borrowed funds will be higher.
- **Operating risk—**Risk that assets will not be properly operated or that operating costs will be higher than projected/forecasted.
- **Maintenance risk—**Risk that assets will be reactively, not proactively, funded and maintained, or that maintenance costs will be higher than projected/forecasted.
- **Variable demand risk—**Uncertainty related to the level of demand and resulting revenue.
- **Security risk—**Risks related to security considerations.

- **Technology risk—**Uncertainty related to capability of technologies employed to provide the level of service required to meet the required outputs. Generally, most relevant when a system depends on new or unproven technologies.
- **Credit reduction risk—**Potential additional risk of higher borrowing rates for other capital projects planned by the City in light of cumulative public debt burden of the current project plus existing outstanding debt when additional debt is incurred in the future for other capital projects.
- **Existing facility failure** prior to completion of new facility
- **Political and economic risk**

From this preliminary list, the initial screening identified two risk factors as the ones most significantly relevant and quantifiable:

- Capital cost certainty (e.g., bid climate uncertainty, design risk)
- O&M risk over life of the agreement

The other potential risk factors identified, which could be transferred to a private entity, could provide additional value, depending on cost impact, in the DBFOM approach. As these risks are not quantified in this VfM, the value for money results reported here may be conservatively stated.

An example of this type of risk would be post-warranty performance risk. Under a DB delivery, for example, performance of the new facility would be guaranteed for an initial warranty period of typically 1 year. The City would be at risk and accountable for the performance of the WTP for the remainder of its asset life. In contrast, the DBFOM partner would hold the risk and be accountable for facility performance for the duration of the partnership agreement. While more challenging to quantify than capital cost risk during the construction phase, experience from the City highlights the potential post-warranty risk. The Mid-Continent Wastewater Plant No. 5 was recently constructed though was only able to operate and meet performance requirements for a short period of time. The current Master Plan indicates the WTP is projected to require $4.4 million in improvements, 13.5 percent of the original construction cost, before it can be operated at its performance requirements.

Other potential risk factors were not considered due to the assumed DBFOM risk sharing agreement. For example, it was assumed that the risk of changes in the cost of financing was not transferred to the private partner, in either of the two procurement alternatives. While it is possible to lock down pricing with private capital sources in advance of close, the risk of market changes prior to financial close was considered equal for each procurement alternative for the purposes of this comparison. A preliminary risk matrix that identifies the assumed risk allocation for the VfM analysis is provided in Attachment B.

The subsections below identify factors used in developing the risk transfer opportunity assumptions included in this analysis for the factors. For each of the identified risks, the cost or impact of the event was estimated as well as the probability of occurrence. Risk premium, the product of the cost of the event and the probability of occurrence, was incorporated into the VfM.

3.9 Capital Cost: Certainty

3.9.1 Design-Build

The DB option would be competitively subject to market bidding conditions and provides a guaranteed lump-sum price for project delivery. DB delivery has become more common across municipalities, as its greater capital cost certainty proves value over the change order conditions experienced in DBB delivery. In practice, the DB may also be subject to change orders executed in response to changing conditions, or client-driven changes in design preferences and scope, but overall, provides greater certainty than DBB.

For major projects generally, it is not uncommon for public agencies to experience cost certainty in the -5.0 percent to 20.0 percent range from planning budgets for major construction projects. This uncertainty can rise significantly on projects over $100 million in value, due to their increased complexity and management challenges. The reasons for these conditions are widely debated, and include a low-bid, not-highest life-cycle value procurement approach that can drive bid prices artificially low, with change orders then used to recover costs, and overly prescriptive designs that may invite improvement and innovation post-award, creating a change condition unnecessarily.

While the City has not completed a project of the size of the WTP recently, and specific City detailed change order information is not available for capital projects, evidence suggests that the City has experienced project cost uncertainty. The East WTP Groundwater Expansion had an original project budget of $25 million that increased to $40 million after selection of DB provider. On the Mid-Continent Water Quality Reclamation Facility, project costs totaled $32.4 million, 18 percent above the 2009 CIP budgeted amount. For this VfM, a conservative -2.0 percent to +10.0 percent range has been incorporated into this analysis to address uncertainties related to scope creep, change orders and initial construction bidding climate.

3.9.2 Design-Build-Finance-Operate-Maintain

Under a DBFOM delivery, there is reduced risk to the City of changes in capital costs. A DBFOM delivery would incorporate a fixed price for the design and construction with limited exceptions. The fixed price for the design and construction would be based on a well-defined scope from the City that would be vetted by the private partner in joint collaboration with the City. The price would be fixed during the procurement process based on the scope covering performance requirements (i.e., treatment standards and capacity) and prescriptive requirements (i.e., equipment requirements and site layout requirements). In the event that there are cost overruns or changes not driven by the City, nor defined in limited change conditions language, the City is not responsible for covering these additional costs. The DBFOM partner would be responsible for covering the cost overruns at their own loss. For the purposes of the VfM, a -2.0 percent to +2.0 percent range has been incorporated to address the very limited set of circumstances under which the capital costs might vary in a DBFOM delivery.

3.10 Operating Risk

3.10.1 Design-Build

During operations for the DB delivery, there is a risk that operating costs will be higher than expected. This risk could be either higher costs at start up or a higher future escalation than expected. The risk of higher costs at startup is not included in the VfM analysis given that the treatment technology is well established and the initial operating costs would be known and calculated.

The risk of future O&M expense escalation has been included in the VfM and is meant to capture the uncertainties in long term operations. The cause of the additional escalation could be lower operating efficiencies, inefficient staffing, and poor preventative maintenance leading to higher reactive maintenance costs. In addition, the higher operating costs can be driven by conflicting interests between the contractor and the long term operations of the WTP. The contractor is selected on a low-bid basis and paid based on completing construction. This creates an incentive to keep construction cost down through lower cost, inferior equipment, design modifications, and materials at the possible expense of long-term operations of the WTP.

The O&M Review noted that the water and wastewater plant staff are currently undertrained and understaffed which may lead to higher long term inefficiencies and costs. In addition, the City has a history of reactive maintenance instead of proactive maintenance, which can result in a much higher emergency maintenance price tag. For example, since 2008, the City has averaged three emergency

repair projects per year that have required City Council approval with an annual cost of approximately $1 million.

Based on market benchmarks and the cases noted above, a conservative -2.0 percent to +18.0 percent range has been incorporated into this analysis to address uncertainties related to open ended exposure to O&M cost overruns and the risk of inefficient staffing and preventative maintenance.

3.10.2 Design-Build-Finance-Operate-Maintain

The DBFOM delivery provides a fixed-availability payment cost to the City inclusive of operations, with few exceptions. The price that the City and DBFOM partner agree to at the outset of the contract is typically adjusted only for inflation based on agreed-upon escalators on hard costs, such as the consumer price index or one of the relevant *Engineering News Record* cost indices as well as a limited number of other change conditions, such as a change in law. The DBFOM fixed-availability payment might also allow for some of the more variable costs to adjust on an agreed upon pass-through basis, should for example, system demand for water treated exceed some specified quantity levels.

This shifts a significant portion of the risk for O&M costs and accountability for performance onto the private partner, and eliminates the open-ended exposure to O&M expenses the City faces under the DB scenarios. The City is not responsible for covering the additional costs in the event that operating costs are above the baseline set in the contract. The higher operating costs would represent a loss to the DBFOM partner instead of to the City.

Accordingly, it was assumed there was not an operating cost risk for the City under the DBFOM delivery business case.

3.11 Risk of Existing Facility Failure

As previously noted, the existing WTP is 75 years old and well past its expected useful operating life. There is a risk of the existing WTP failing before the new WTP is completed. Due to the lack of redundancy, a failure at the existing WTP would result in the City being unable to provide potable water to its approximately 650,000 residents.

While the existing WTP could fail during the construction of the new WTP under any procurement method, the different construction times affect how the risk is accounted for. Accelerated construction reduces the risk of failure in the DBFOM business cases. However, there is subjectivity to calculating the likelihood and extent of existing facility failure, therefore these costs were not quantified in this VfM.

3.12 Key Inputs

Key inputs to the VfM analysis are summarized in Table 3-1 for the water treatment facility.

3.13 Results

This section provides VfM results in terms of the total present value (PV) of project life-cycle costs, including direct capital and operating costs over the 30-year study period. In addition, as per standard methodology, the VfM analysis incorporates the net PV of the two core performance risk transfers to the private partner identified in the preceding section. The PV assumes a discount rate of 3.75 percent, which reflects the City's cost of capital. Monetized risk factors widen the margin between delivery methods. Considering the monetized risks inherent in DB and DBFOM delivery, the total project costs range as demonstrated in Figure 3-1.

Table 3-1. Key Inputs for the VfM Analysis for the New WTP

		DB	DBFOM
Base	Base Capital Cost, $ million	$ 380.5	$ 316.2

Assumptions	Term, year	30	30
	Weighted Average Cost of Capital, percent	3.75	6.00
	Issuance Cost to City, percent	1.5	0.0
	Structuring Costs and Fees, $ million	$ 0.0	$ 5.0
	First Year O&M, $million	$ 19.8	$ 17.5
	First Year DBFOM Management Fee, $million	$ 0.0	$ 0.7
	O&M Escalation, percent	3.0	3.0
Risk Factors	Construction Change Orders, percent	-2.0 to 10	-2.0 to 2.0
	Probable Operating Cost Overruns, percent	-2.0 to 18	0.0

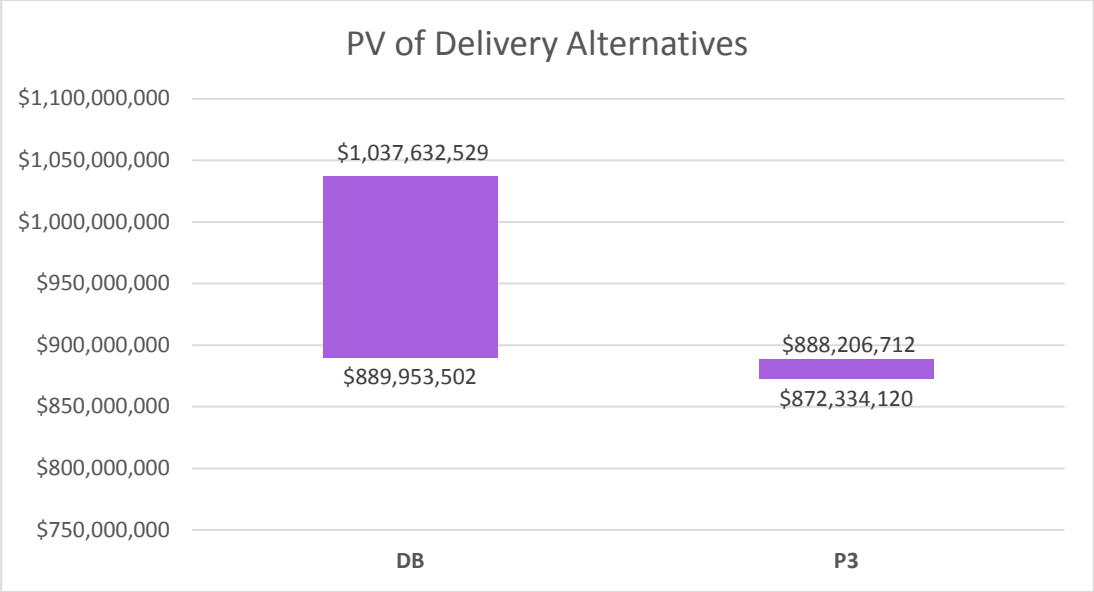


Figure 3-1. Summary of the NPV Results ($millions)

The results of the VfM analysis demonstrate that when monetized risks are included in the project cost comparison, there is a difference range of $1.7 to $165 million in life-cycle costs between the DB and DBFOM delivery alternatives. In addition, there may be a number of other potential benefits that go beyond this VfM analysis, which are discussed in the section below - Other Benefits of Alternative Delivery Methods.

3.14 Other Benefits of Alternative Delivery Methods

In addition to the comparative impacts of the delivery methods on the life-cycle valuation of the WTP, each procurement method may have broader programmatic impacts that affect other aspects of the City. Three main impacts of alternative delivery have been identified: the need for lower revenue (rate) increases, the ability to produce an earlier project completion date, the ability to pay for and accelerate other projects.

3.14.1 Rate Increase Impacts

Alternative financing employed in a DBFOM structure can have benefits for the City including lower coverage requirements and flexible financing terms which could result in a lower and more gradual rate

increase to pay for the new WTP and a reduced impact on the debt capacity of the City. The City currently maintains a 2.0 coverage on its senior debt and would need to retain a 1.75 to 2.0 coverage for any new debt issued to finance the NW WTP to maintain the current bond rating. The availability payment proposed here is treated as an expense for the city and does not require additional coverage, lowering the revenue requirement for the DBFOM independent of the lower life-cycle costs. In addition, the taxable bonds employed here have a delayed draw feature which allows the project delivery partner to only draw on the financing as it is needed, avoiding interest costs during construction and allowing for lower near term rate increases.

While the municipal revenue bond market has historically reviewed only the senior debt coverage ratio to determine senior bond ratings, there is becoming a stronger tendency to consider the "All-In" debt coverage ratio in determining bond ratings, including senior, junior, and off-balance sheet financing. Considering the "All-In" debt coverage ratio, there may be limited advantages of a DBFOM delivery in additional debt coverage availability and associated lower revenue requirements.

3.14.2 Earlier Project Completion Date

The net effect of the DBFOM financing terms described above is that the project is likely to have an earlier completion date. The DBFOM can likely deliver a new WTP a year earlier than the DB delivery. Including this increased risk would further widen the gap in the base case between DBFOM and DB, but is conservatively not included in the VfM analysis.

3.14.3 Impacts on Other Projects

Alternative delivery of the WTP may allow for accelerated funding of other utility infrastructure projects. As discussed above, the DB and DBFOM delivery scenarios have different debt coverage requirements on the debt payments which impact the capacity to finance near term projects throughout the remainder of the water and wastewater system. These benefits to the remainder of the system are not quantified here.

3.15 Procurement Method Recommendation

While the VfM results indicate a DBFOM approach as competitive to deliver a new NW WTP, a broad range of additional qualitative considerations may shape the eventual procurement method selection. The City may find it advantageous to weigh these considerations through a formal, structured procurement decision process. The objective of a formal (multi-criteria) decision process is to assess the full range of procurement criteria in order to determine how well a given method meets the City's preferences. In some instances, an owner or project sponsor may have a compelling reason for selection of a single delivery method without a more formal decision process. Accountability and alignment with the public's best interest should be the guiding principles in this decision.

3.16 Implementation Strategy

Assuming the City approves and makes the decision to construct a new NW WTP and approves the required funds to support the project, the key objective of the proposed implementation process is to advance the NW WTP at reduced risk, cost, and uncertainty for the City. To that end, the recommended process is defined by one, transparency; two, collaboration; and three, accountability. One, proceeding on an open book basis allows for the highest shared value between the public and private partners, and the most cost-effective reduction of risk contingencies and change order conditions. Two, the progressive DBFOM/DB approach, which allows for project continuation decision points, is led jointly by the City team and its private sector partner or project company, with the City at the table engaged in all design, technology selection, cost, timing, risk and financing decisions. Three, the recommended process methodically results in a hand-off of risk to the private partner.

The progressive DBFOM/DB process is structured to achieve the joint development of the following deliverables: a guaranteed maximum price (GMP) for the project; a 30-year performance guarantee backing the operations service phase; committed at-risk financing; and a binding 30-year business plan with mutually defined performance requirements and hand-back provisions in the service agreement. The city retains the right to accept or reject the approach up to the point where a contract is developed and executed with a GMP, after which the delivery risk transfers to the partner, or project company.

Choosing a 30-year financing of a major project such as the NW WTP requires careful upfront due diligence to align expectations, understand and transfer key risks, and ensure the least cost impact to ratepayers. Beginning at 0 percent design with a deeply preliminary and conservative cost estimate on the NW WTP of $316 to $380 million, the project company would work together with the City through an accelerated design process consisting of the following four tasks, to define and reduce cost and apportion risk up to GMP:

- Task 1: Stakeholder Workshop: Process and Risk Register Training
  - Performance requirements workshop
  - Conceptual design
- Task 2: Technical Memorandum at 5- to 10-Percent Design
  - Preliminary risk register
  - Financing term sheet (indicative)
  - 30-year service phase term sheet (indicative)
  - City's first decision point and off-ramp
- Task 3: Technical memorandum at 30- to 50-percent design
  - Developed risk register
- Task 4: GMP
  - Workshop
  - Final draft committed financing documentation
  - Final draft service phase agreement for council review
  - City's second decision point and off-ramp

At both decision points and associated off-ramps, the City, if it chooses, has a no-penalty off ramp to proceed from a Progressive DBFOM approach to a PDB or conventional DBB approach at the cost of developing the preliminary design documents and possession of the design work product for conventional RFP issuance. The technical memorandum provides a highly reliable cost estimate and will allow the City to confidently make an informed delivery choice after a modest investment of time and money. Regardless of the ultimate delivery and financing of the project, the team sees this approach as providing the most expedient and lowest risk process for moving the NW WTP forward.

Figure 3-2 provides an overview of the process, and depicts as well the implementation phase, should the City elect to move forward at the GMP decision point. If the City chooses to abandon the DBFOM either at the end of Task 2 or Task 4, it would remunerate the project company's out of pocket cost and would have the right to take the design work product and deliver conventionally. The cost of exiting at the end of Task 2 is market-based and negotiable based on scope and further definition. The cost of exiting at the end of Task 4 or GMP is market-based and reflects developing to 30- to 50-percent design, cost estimating a firm bid price, and drafting 30-year contractual documents.

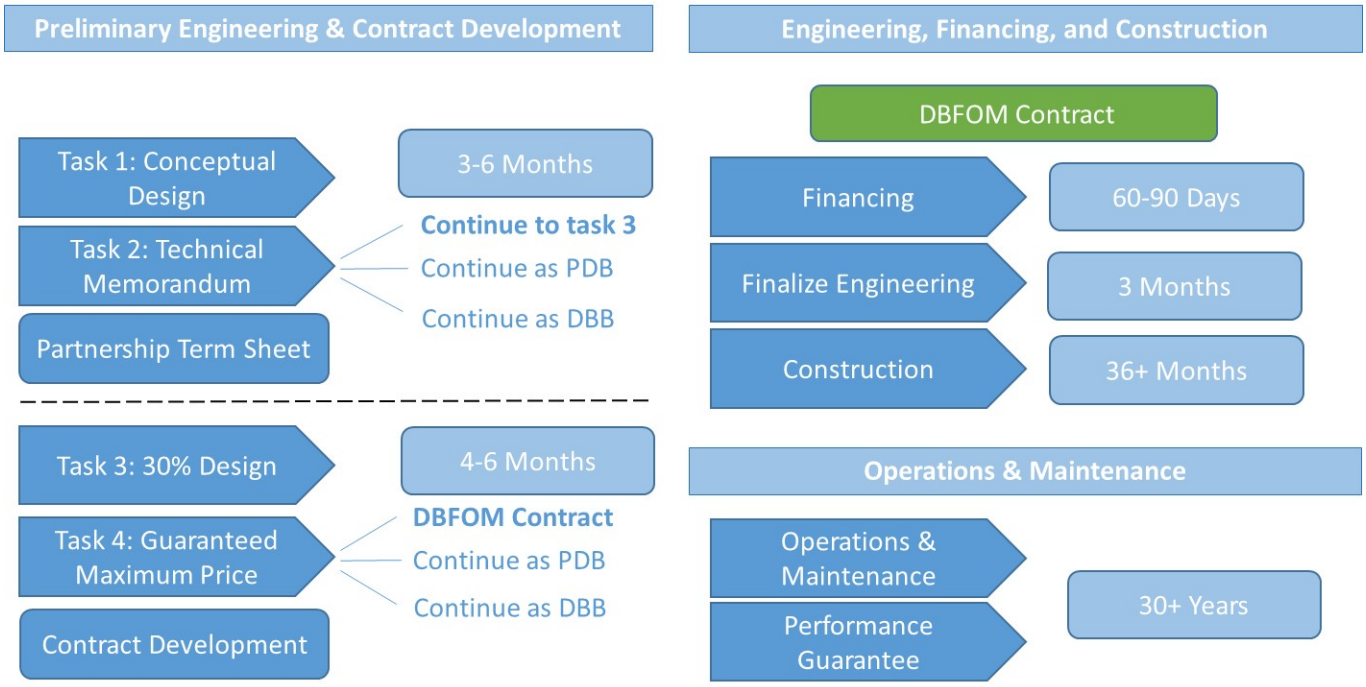


Figure 3-2. Proposed Progressive DBFOM/DB Implementation Approach

At the GMP point at the close of Task 4, the project team moves to financial close, and provides a 30-year performance guarantee covering design, construction, and ongoing performance. The City retains ownership of the project, ownership of all water rights and supply, all rate-setting authority, and an ongoing lead consent role. The City has an obligation to pay a fixed-availability payment on an agreed upon schedule. This payment is developed and negotiated on an open book basis, and is contingent on the ongoing compliance of the NW WTP with the defined performance metrics. Over the life of the partnership, the project team's performance is objectively evaluated and reported on against the performance metrics jointly established in the Service Agreement and measured against the Availability Payment obligation, and the City retains termination rights including defined handback provisions.

In summary, under the recommended Progressive DBFOM/DB delivery for the NW WTP, the process is defined by four preliminary tasks in which all of the project, financing and contractual elements are mutually defined and produced for scrutiny and review before any final mandate.

Attachment A
Alternative Delivery Methods

Attachment A—Alternative Delivery Methods

Overview of Applicable Delivery Models [1]

Procurement methods and delivery models for large infrastructure investments can take numerous forms, ranging from standard design-bid-build (DBB) techniques through construction management-at-risk to full at-risk collaborative delivery, including many variants of design-build (DB), public-private partnership (P3), and Alliance Contracting techniques.

Similarly, finance options and related value for money analyses were considered in parallel with the delivery model and operations analyses. Recognizing that DB methodologies are fundamental to any P3 approach that requires some form of financing, the intent was to identify the best delivery structure for design, construction, and operations and apply financing and P3 concept as enabling or value-added improvements to the preferred approach.

Based on the above, for the purpose of evaluating applicable delivery models for Wichita, we bracketed the spectrum of available options as illustrated in Figure A-1.

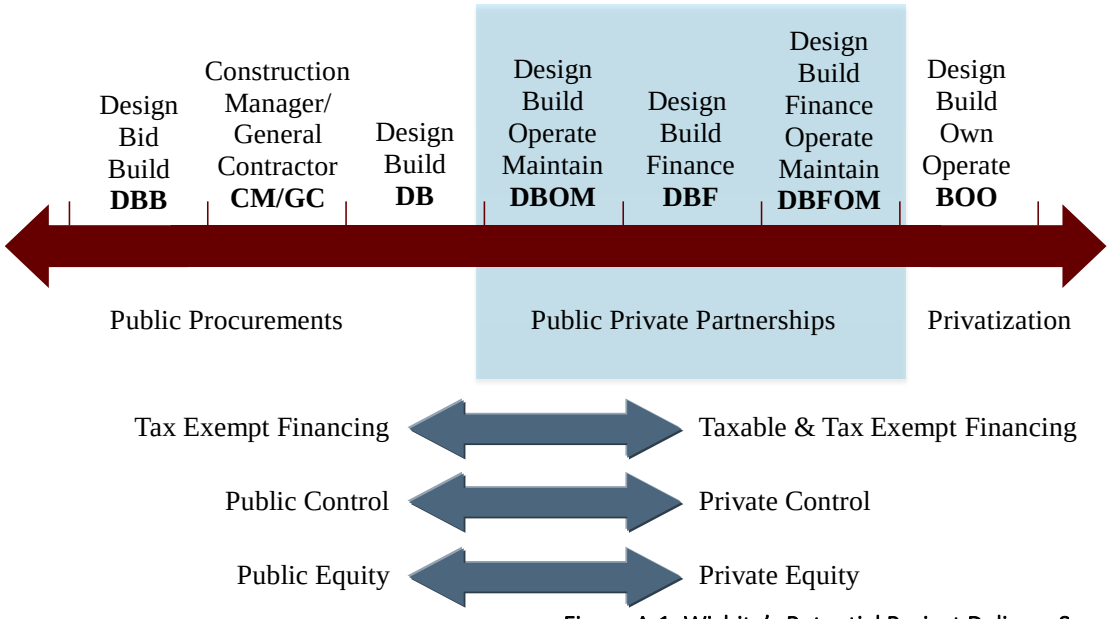


Figure A-1. Wichita's Potential Project Delivery Spectrum

(under the assumption that operations and/or financing can be integrated with any model, if desired)

The project delivery and procurement methods shown in Figure A-1 have generally evolved from the traditional DBB approach as the "baseline" most commonly used by public entities. In recent decades, the various collaborative delivery methodologies have emerged as viable alternatives to traditional delivery. These alternatives to DBB seek to better allocate risk and responsibility, save time, and support a selection methodology beyond low-bid capital price. The potential improvement to traditional delivery is supported by re-defined contractual relationships. These relationships are shown in in Figure A-1 via

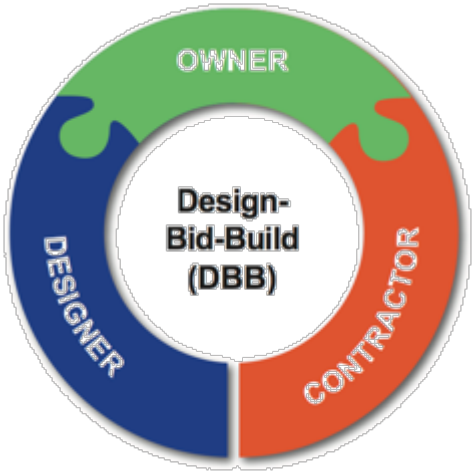
[1] Portions of the text and figures in this section were taken from the *Water and Wastewater Design-Build Handbook*, Fourth Edition. Design Build Institute of America, Water Design-Build Council. 2016.

two forms: formal **contractual relationships** indicate firm relationship agreements executed between the given entities and **embedded relationships** represent the collaborative connections required, but not formally contracted, to make the given model a success.

Each traditional and collaborative project delivery method has its own attributes that generally differ in terms of allocation of risks and responsibilities, scheduling and schedule certainty, ownership, performance guarantees, and procurement complexity.

Design-Bid-Build

DBB has historically been the most common approach to development of public infrastructure projects. The DDB process has also been used extensively by the private sector to procure new facilities. DBB was considered as the "baseline" contract delivery model for the City of Wichita's Water and Sewer Utilities.



A typical DBB project involves the owner engaging one or more engineering firms to develop a detailed design and specifications, and assist with obtaining local, state, and federal approvals for the project. The owner then uses the detailed design and specifications package as part of a tender package to obtain bids from contractors. The contractor selected through the bidding process is subsequently engaged to construct the facility in accordance with their bid price and schedule. Typically, the contractor is paid monthly progress payments, and the owner applies holdbacks on payments in accordance with governing state or local law. Throughout the DBB process the public partner remains at risk for the cost, timing and performance of all project elements. And post completion of construction the public partner is at risk for all aspects of operations and maintenance (O&M). Table A-1 lists the advantages and disadvantages of DBB delivery.

Table A-1. Advantages and Disadvantages of DBB

Advantages to Owner	Disadvantages to Owner
• Well understood and time-tested process and procedures. • Ability to select subconsultants by qualifications and cost in the traditional manner. Limited at-risk exposure to local professional firms. • Bids to full plans and specifications. • Full going-in construction price known at bid time. • Fully accepted and viable under applicable procurement statutes	• Linear process takes time. • Little or no designer/contractor collaboration. • Limited job size/scope may not attract best potential technologies/best practices. • Relies on engineer's estimates until very late in the project. • Hard bids subject to design omissions and resulting change orders. • Little opportunity to select contractor on qualifications and past performance in addition to price. • Separate contracts for design and construction creates multiple points of contact for owner and does not align business interests. • Not readily conducive to integration of a performance-based operations commitment. •

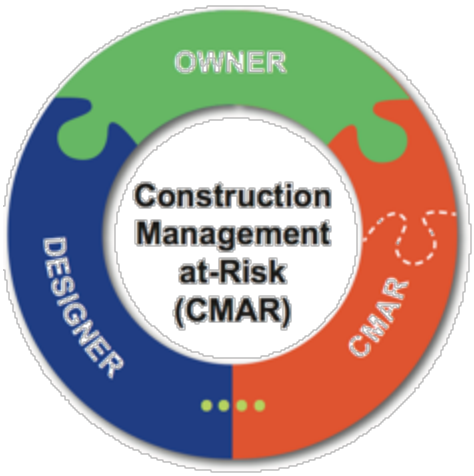
Typically, on a DBB project, the design and permitting phases are completed by the design team before the owner releases the design for construction. This sequence leads to a longer overall delivery

schedule, but it also reduces exposing the owner's capital to risks resulting from permitting delays or unexpected changes in permit conditions.

Roles in a DDB project are normally very clearly defined. Design and project performance risks lie with the design team. Construction and scheduling risks lie with the contractor. Operations risk rests with the Owner or a third-party contract operator, however, contractors and operators do not have significant input into the design, which can contribute to issues. Claims during construction are common, and the requirement for some redesign during construction exists. In addition, long-term operational performance responsibility and risk is not transferable using DDB delivery.

Construction Management At-Risk

Construction management at-risk (CMAR) is a traditional delivery model where an intentional overlap is created between the engineer and the contractor, allowing the contractor to bring construction insight to bear as early as practical in the design process. Sometimes referred to as "design-build-light," this methodology maintains two separate contracts as with DBB, but encourages collaboration during design to reduce risk once the contractor proceeds to construction in the field.



While in conformance to most traditional procurement processes (the engineer is selected using traditional professional services criteria), this method introduces the concept of contractor selection without a hard bid of the construction cost. Instead, contractors are generally selected based on their qualifications in combination with their proposed scope of services and fee for service prior to construction as well as their fee and overhead costs for construction services. The ultimate construction cost is developed during the design period, typically in an open-book fashion, and ultimately agreed upon as a "guaranteed maximum price" (GMP) or lump-sum prior to authorizing the start of construction.

Where agreement on a GMP or lump sum cannot be reached or construction pricing competitiveness cannot be verified, owners often maintain the option to convert the construction scope to a hard-bid request. In many instances, owners convert GMPs to lump-sum pricing.

While promoting collaboration early in the design process, the formal contract vehicles with separate agreements between the Owner and Engineer and the Owner and Contractors are essentially as unchanged compared to traditional DBB delivery. During construction delivery, traditional practices for managing contractor change orders, requests for information from the designer, and verification of construction performance remain unchanged. Table A-2 lists the advantages and disadvantages of CMAR delivery.

Design-Build

Under a DB structure, the owner enters into a single contract with a single DB entity (or a consortium of entities acting together as one entity). Generally, the DB contractor has the responsibility of designing and building a project that meets owner-prescribed performance standards and the owner would then pay the DB entity based on certain construction milestones being achieved.

In practice, DB build can be procured using a number of different methods, tailored to meet procurement statutes and practice as well as to align with project complexity and the level of design completion anticipated to be undertaken prior to the procurement. DB models also support performance risk transfer for both design/construction.

Table A-2. Advantages and Disadvantages of CMAR

Advantages to Owner	Disadvantages to Owner
• Relies on proven, accepted method for selecting professional engineering services based on qualifications/price. • Integrates constructability earlier in the design process. • Provides contractor-led estimates earlier and allows scope revision during design to meet project budget. • Can reduce overall project risk and contingency. • Can reduce design misunderstandings and resulting potential for change orders. • Allows qualifications and past performance to be taken into account when selecting a contractor. • Allows permitting process to be integrated into design and construction planning.	• Relies on engineer's estimate for initial cost characterization. • Creates a "forced marriage" between designer and contractor that may – or may not – work. • Final construction scope still subject to change order potential. • Added cost to owner for contractor's pre-construction phase services (although may be offset with construction savings due to early collaboration). • Requires selection of contractor based on fees without knowing full construction price. • Separate contracts for design and construction creates multiple points of contact for owner and does not align business interests. • Does not inherently allow support performance risk transfer - design obligation is traditional "Standard of Care" and construction obligation is to build according to the specified design. • Not readily conducive to integration of a performance-based operations commitment. • May have limitations on being allowable under applicable procurement statutes.

The various forms of DB procurements differ largely in the type of pricing requested of proposers and in the degree of problem definition developed for the project in advance of a procurement and subsequently provided to the design-builder in the request for qualifications (RFQ)/request for proposals (RFP). Two fundamental DB models are the progressive DB (performance-based) or the fixed-price DB (prescriptive) methods, described below. Note that for the City of Wichita Water and Sewer Utilities VfM, the fixed-price DB (FPDB) method was assumed.

Progressive Design-Build

In a progressive DB (PDB) procurement, a design-builder is selected based primarily on qualifications and, where local practice requires it, limited pricing information generally similar to the construction management at-risk model with an added component of cost for design and preconstruction services (either in a lump-sum for or on a not-to-exceed basis). As the design-builder develops the design, a construction cost estimate is progressively developed, often in conjunction with the 30- and 60 percent levels of design detail. Once the design is well advanced (beyond 60 percent and often up to 90 percent), a GMP is defined for approval by the owner. (As with CMAR, some owners convert GMPs to lump sum pricing.) If the design-builder and the owner cannot reach agreement on an acceptable GMP or lump sum, the owner can use the completed design as the basis for a hard construction bid procurement.

PDB procurements are often preferred when a project lacks definition or when an owner prefers to remain involved in the design process while leveraging the

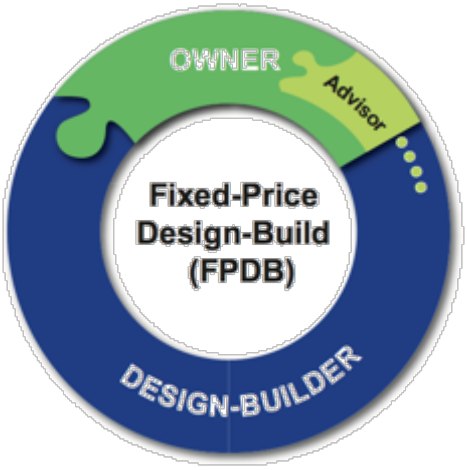
schedule, collaboration, and contractual advantages provided by DB. This model is also valuable when regulatory permitting requires well-developed design solutions, or when an owner believes that they can lower cost by participating in design decisions and in managing risk progressively through the project definition phase. Owners do not generally use the progressive procurement method when a project's definition is well advanced prior to the procurement or when a lump sum construction price is preferred (or required) to select a design-builder. Table A-3 summarizes the advantages and disadvantages of PDB delivery.

Table A-3. Advantages and Disadvantages of PDB

Advantages to Owner	Disadvantages to Owner
• Maximum control over project design, construction, and O&M life-cycle costs because final contract is not signed until a large portion of the design is complete • Single straightforward and inexpensive procurement process can be completed in short timeframe. • Increased marketplace interest due to relatively low proposal preparation cost. • Allows selection of designer and contractor based on past performance, qualifications, and ability to work as a single-entity team with aligned interests for project success. • Provides progressively accurate, contractor's estimates of total project costs from earliest point in project through GMP definition. • Provides maximum opportunity for designer, contractor, and owner collaboration to define scope, meet schedule and budget, and tailor subcontracting plan. • Provides on "off-ramp" to hard-bid construction if GMP is not competitive or cannot be agreed upon. • No contractor-initiated change orders. • Requires little or no design to be completed by owner in advance of procurement and provide maximum flexibility in a final determination of project viability for economic and non-economic factors • Provides a performance risk transfer mechanism that can be implemented in conjunction with long-term operations commitments. • Single contract and point of contact with owner.	• Requires selection based on fee, full construction cost is not known at the time of initial contract. • Existing project design investment may not be of value or use to design-builder. • May not be as fast to deliver as other DB methods due to potential for extended design/estimate development period, including involvement of numerous stakeholders in the design process. • May not be perceived as being "competitive" for construction pricing. • Requires significant owner staff involvement and resources during design. • May limit local/small subconsultant participation due to at-risk nature of the work. • As a DB approach, may require a project finance component to comply with applicable procurement statutes.

Fixed-Price Design-Build

In an FPDB procurement, the RFQ/RFP generally includes a conceptual design as a minimum and a 30-percent design as a maximum. Requirements are stated as measurable performance objectives of the completed project rather than the specific approaches or processes the design-builder should follow to achieve those objectives.



A performance-based procurement gives design-builders' the flexibility to propose how they will meet the owner's objectives while requiring proposers to provide a lump sum, fixed price for completion of the project. Alternatively, owners may ask for a "target price" for construction that establishes a not-to-exceed construction price basis, while allowing the owner to collaborate on and adjust scope during detailed design definition. In this case, the "target"

lump sum can be adjusted after award, but only as directed via owner-approved scope changes. Except for these explicitly approved owner changes, the design-builder must conform to their originally proposed price.

Performance-based procurements are often preferred when an owner has a clear vision for how a facility must perform, or has limited resources, time, or interest in the specific method for gaining required performance. This model is used to prompt industry's most innovative and cost-effective solutions through what is essentially a design competition, typically in combination with a need to accelerate schedule. Table A-4 summarizes the advantages and disadvantages of PDB delivery.

Table A-4. Advantages and Disadvantages of FPDB

Advantages to Owner	Disadvantages to Owner
• Maximum potential for DB cost savings through design innovation during competitive procurement. • Maximum transfer of design-related performance risk to design-builder. • Minimal design work by owner required prior to procurement, resulting in relatively low cost to prepare RFP. • Fastest possible procurement and project delivery schedule. • Perceived as "competitive" construction pricing, providing full contract cost at bid time. • Allows selection of designer and contractor based on past performance, qualifications, and ability to work as a single-entity team with aligned interests for project success. • No contractor-initiated change orders. • Provides a performance risk transfer mechanism that can be implemented in conjunction with long-term operations commitments. • Single contract and point of contact with owner.	• If life-cycle cost is not analyzed or operations not included in scope, may result in higher O&M expenses or undesirable project features. • Proposal evaluation and selection is relatively complex. • Limited ability to predict what will ultimately be proposed. • Lump sum pricing may include excess risk and contingency cost due to undefined project scope. • Limited opportunity for owner and design-builder collaboration on design during procurement process. • Limited ability for owner to adjust proposed design, scope without resulting in owner-initiated change orders and resulting price adjustments. • May limit local/small subconsultant participation due to at-risk nature of the work. • As a DB approach, may require a project finance component to comply with applicable procurement statutes.

In a prescriptive FPDB procurement, the RFQ/RFP typically includes at least a 30-percent design completed by an owner's consultant prior to the procurement, sometimes referred to as "bridging documents." Requirements are stated in terms of specific approaches or processes the design-builder must follow.

Prescriptive procurements are often preferred when owners are very clear on their preferences and want to use DB to accelerate the schedule while allowing selection of a design-builder based on a combination of qualifications and a lump sum price. While a design-builder may offer a variation or alternative concept to the bridging documents, procurement procedures are often established to require owner review and approval of these exceptions or "alternative technical concepts" in advance of the proposal submittal. With this method, the lump sum price in the design-builder's proposal is only adjusted for specific owner-initiated scope changes, generally due to unforeseen conditions or a change in law or regulatory practice.

Design-Build-Operate

Whether an owner chooses FPDB or PDB delivery, the arrangement may be extended to encompass long-term O&M of the completed project.

Design-build-operate (DBO) comprises all components of DB—including design, permitting, procurement, construction, and testing—as well as O&M services. The owner's role and final acceptance

of the project does not conclude with delivery, but continues through to a defined operational term. For this reason, owners generally use the best-value selection approach, emphasizing the project's entire life-cycle cost.

Not every design-builder will have all the necessary qualifications to integrate the O&M function into the proposal team. DBO delivery teams may be led either by a single firm that has all such functions within its organization, or by a team of consisting of a design-builder and separate O&M firm.

The DBO team functions as if it is the owner's team throughout the term of its agreement. Moreover, the DBO team—not the owner—assumes the risk for cost, performance, commissioning and acceptance testing, regulatory permit compliance, treatment capacity, repair and replacement, and handover condition at conclusion of the O&M contract. The risk transfer in the DBO case is not supported by equity at risk and thus does not provide the level of performance guarantee and risk transfer available under the design-build-finance-operate-maintain (DBFOM) case. And this approach does not provide the off-balance sheet financing available in the DBFOM case.

Public-Private Partnerships and Design-Build-Finance-Operate-Maintain

DBFOM, often referred to as a public-private partnership (P3), is a collaborative-delivery method focused on the project's entire life-cycle. P3s integrate private financing support and operations into the procurement of the project.

DBFOM comprises all the components of DB and DBO—including design, permitting, procurement, construction, and testing—as well as project financing and O&M services. The owner's role and final acceptance of the project does not conclude with delivery, but continues through to a defined operational term. The DBFOM team functions as if it is the owner's team throughout the term of its agreement. Moreover, the DBFOM team—not the owner—assumes the risk for cost, performance, commissioning and acceptance testing, regulatory permit compliance, treatment capacity, repair and replacement, and handover condition at conclusion of the O&M contract. The added scope and performance assurances provided in the DBFOM case are supported by equity at risk.

A two-phase, RFQ/RFP procurement is typically used in selecting a DBFOM developer. During the first phase, proposal teams are shortlisted based on the team's financial and technical qualifications, as well as experience on similar projects. Typically, three to five teams are shortlisted to ensure interest from qualified teams, while ensuring adequate competition. During the second procurement phase, the shortlisted teams submit proposals in response to an RFP detailing the performance requirements of the facility. The winning team is selected based on price and proposed solution.

Due to the complicated nature of a DBFOM contract, procurement may be a lengthy process. It is not uncommon for procurement processes to take 1 to 2 years, although in Wichita's case, this procurement can be accelerated with the delivery team in place through the first phase.

The DBFOM developer is typically a project company, also known as a special purpose vehicle (SPV), created for the purpose of delivering the project that is made up of multiple team members including a contractor, operator, and financer. Figure A-2 illustrates the typical contract structure.

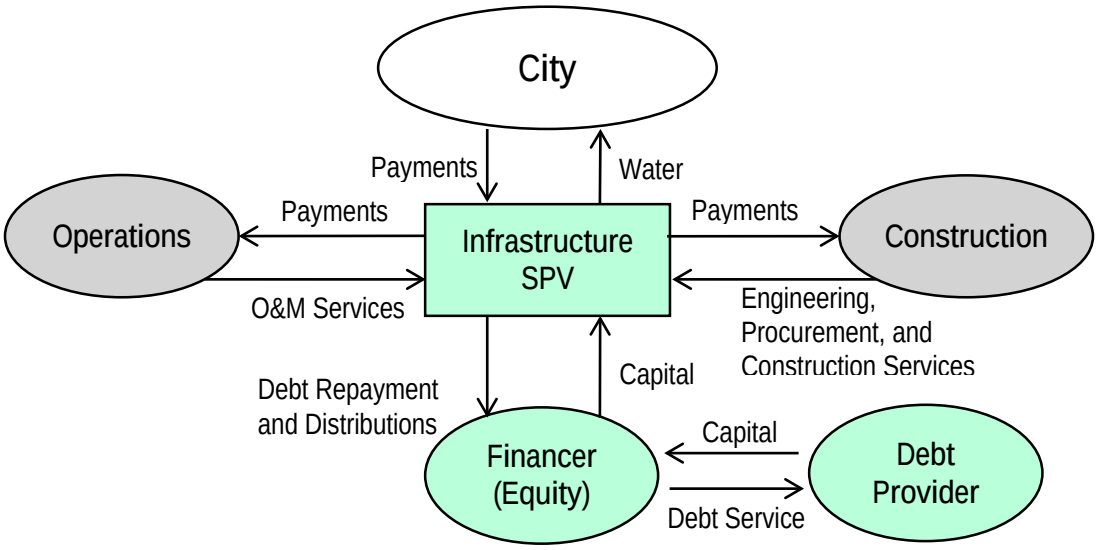


Figure A-2. P3 Contract Structure

Payment for the private financing is typically paid for over the operating period, as "capital payments" which would include repayment of capital as well as financing costs, similar to traditional debt service. The investment would be financed by the DBFOM developer using a mix of debt (invested by banks or bondholders) and equity (invested by one or more of the member firms of the SPV).

Payment for O&M (called the service fee) would be made on a periodic basis according to a schedule agreed to by the City and DBFOM developer. The payment would include a fixed component and a variable component based on water production. The service fee would be indexed to the consumer price index or other relevant inflation index as agreed upon by the City and P3 partner.

At the end of the operation period, the plant is transferred back to the City in a specified handback condition. Handback conditions and their enforcement ensure that the assets are well maintained during the operating period such that the plant can be reliably utilized by the City for a reasonable period of time before additional investment is required.

When compared to other delivery methods, DBFOM links almost all aspects of the project under one contract. The DBFOM developer is driven to consider the entire life-cycle of the facility when making design and construction decisions. It may be that implementation of a more expensive or riskier treatment process may result in lower operating costs and a lower total life-cycle cost. This holistic view of the project in conjunction with a competitive procurement process may result in lower life-cycle costs than traditionally delivered projects. Table A-5 summarizes the advantages and disadvantages of DBFOM.

Table A-5. Advantages and Disadvantages of DBFOM

Advantages to Owner	Disadvantages to Owner
• Maximum potential for life-cycle cost savings through innovation during competitive procurement. • Maximum transfer of project performance risk to DBFOM Developer. • Competitive project pricing, providing full project cost over life of the project at bid time. • Allows selection of designer and contractor based on past performance, qualifications, and ability to work as a single-entity team with aligned interests for project success. • No contractor-initiated change orders. • Single contract and point of contact with owner.	• Proposal evaluation and selection is relatively complex. • Added cost of equity to achieve this level of risk transfer, which is presumed to be off-set by added VfM. • Limited ability to predict what will ultimately be proposed. This issue is mitigated when PDB is integrated into the DBFOM contractual structure. • Limited opportunity for owner and DBFOM developer collaboration on design during procurement process. Following from above issue is mitigated when PDB is applied. • Limited ability for owner to adjust proposed design, scope without resulting in owner-initiated change orders and resulting price adjustments. • May limit local and/or small subconsultant participation due to at-risk nature of the work. However, this issue can be negotiated but may impact cost.

Evaluating and Selecting an Alternative Delivery Method

Implementing an effective project procurement and project delivery system for a complex infrastructure project requires an understanding of a wide spectrum of proven contracting methodologies, and accompanying insight to how varying methodologies can align with specific project needs and risk allocations.

Evaluating the benefits of a given procurement and project delivery models should consider several over-arching goals that are essential to defining a successful procurement and follow-on project:

- **Transparent—**All procurement processes, methodologies, and selection criteria must be fair, objective, and transparent to the professional services and construction community. No work should be awarded outside of a well-advertised and fairly administered competitive process. There are various approaches to ensuring transparency. For example, under the Wichita RFP, it is proposed that PDB be utilized to design and construct capital improvement program (CIP) projects over $50 to $100 million. The PDB process is an open-book process with off-ramps that protect the City from any lack of transparency.
- **Cost effective—**Any procurement methodology should ensure that the owner is receiving best value for the services and construction they are purchasing. To the extent possible, services should be priced and price should be evaluated as part of the selection methodology. Generally, this goal supports target, GMP, or lump-sum pricing when possible, although fee-based pricing may be acceptable if the contracting methodology provides an “off-ramp” for hard-bidding construction work to ensure cost competitiveness.
- **Objective-focused—**Procurement selection strategies should be based on clearly defined evaluation criteria that mirror project challenges and opportunities for project success. In turn, the evaluation criteria will support overall project success.
- **Efficient—**The cost for implementing the procurement process should be minimized in favor of using funding to maximize delivery of actual project scope. Similarly, the bidding community’s resources should be respected by minimizing to the extent practical the cost to propose on work.
- **Timely—**Duration of procurement processes should be minimized, allowing for sufficient response time from bidders in conjunction with a reasonable amount of time to evaluate proposals without

other undue delays. Valuable time should be conserved and made available for execution of project scope.

- **Inclusive—**The overall procurement process should ensure that local subconsultants and subcontractors have equal access to project scope for which they are qualified. Projects should be packaged to ensure wide participation, especially for alternative delivery models which might otherwise preclude local firms from at-risk work.
- **Compatible—**Procurement methodologies must remain consistent with existing regulatory and procurement policies unless specific changes are approved to accommodate identified benefits of alternative delivery. Required modifications to procurement process and practice should be clearly identified as part of the alternative delivery analysis.

Another critical aspect of implementing the procurement methodology is the development of a transparent scoring methodology that drives proposers to solutions that meet the owner's needs at the best life-cycle cost, yet with an understanding of the available capital budgets for the project. It is essential that the selected scoring methodology be tested to ensure that highly rated qualifications are effectively scored in relation to price, reaching an optimized balance that does not force a high-price selection while avoiding the necessity to always accept a low price proposal. Numerous examples of scoring methods are available for consideration and these should be considered in detail and tested prior to implementation.

Recognizing that Wichita's optimization program has specific requirements and challenges, each of the goals identified above should be augmented by program- and project-specific issues and concerns. To understand specific procurement- and delivery-related issues, some Program Sponsors find that a series of facilitated workshops is beneficial. A list of collaborative delivery issues previously identified by owners with similar challenges can be used as starting point for these discussions, and then adapted to reflect to input provided by Wichita. The outcome of this effort is typically the identifications of the primary areas of assessment for delivery-related issues, such as the following:

- **Achieving project consensus and approval** is a summary of issues as to how the timing and requirements for permitting the Program relate to the timing and constraints for optimizing the Program's preferred technology, physical design, and preferred procurement and risk-transfer approach.
- **Defining project scope and configuration** includes the issues related to coordination of primary project components and the inclusion of Wichita preferences and operations support into the procurement process.
- **Getting the "best" price** focuses on the preferred definition and importance of price, to what extent price should be a factor in the procurement process, and how best to obtain preferred pricing.
- **Getting the "best value"** expands the discussion from price alone to how Wichita defines value, ranging from capital to life-cycle costs to the inclusion of non-economic factors in the procurement process.
- **Establishing accountability for performance** assesses Wichita's preference for transferring short- or long-term performance risk and the trade-offs in terms of innovation and control for doing so.
- **Optimizing internal Wichita culture and organization** addresses Wichita's organizational priorities for engaging additional in-house staff or third party's to support a one-time, large, complex program.
- **Accommodating external stakeholders** evaluates the best means, methods, and degree of accommodating stakeholder input over the Program's life-cycle.

- **Minimizing environmental and social impacts** addresses priorities and approaches minimizing the Program's potential effects on stakeholders.
- **Considering alternative risk transfer approaches** considers options and priorities for accommodating a variety of non-traditional risk transfer methodologies and incentives.

Based on the discussions with Wichita staff, the above groupings could be modified, expanded or removed, as appropriate. In conjunction with identifying the key issues specific to Wichita as noted above, an effective delivery methods analysis requires confirmation and assessment of each delivery methods' strengths and weaknesses. The starting point for this understanding is represented by the "conventional wisdom" documented by various industry organizations such as the Water Design-Build Council and the Design-Build Institute of America as well as through direct experience with other owners with similar large infrastructure implementation challenges. As such, the strengths and weaknesses of each primary delivery model are generally well understood and documented as per the discussion on each model above.

Attachment B
Preliminary Risk Matrix

Attachment B—Preliminary Risk Matrix

General Risks

RISK	ALLOCATION	REMARKS
Ownership		**The City retains ownership of the facility and sets performance criteria**
• Performance Criteria	City	The City sets the required performance criteria and design standards.
• Rate Setting	City	The City will set water and sewer rates as needed to meet the required payments to the contractor
Design		**City typically reviews designs through an established review procedure in DBFOM Agreement.**
• Technology Selection	Contractor	Contractor is responsible for performing all design work and selecting technology that is proven, will be permitted by agencies, and will meet performance guarantees.
• Technology Obsolescence	Contractor/City	Contractor is responsible for technology obsolescence, except for change in law, unforeseen circumstances, and unspecified conditions for raw water and water demand. Risks for change in Law and unforeseen circumstances are the City's risks.
• Subsurface Conditions	Contractor/City	Contractor is responsible for assuming all structural and geotechnical subsurface risk; archaeological and hazardous waste defined as uncontrollable circumstances.
Construction/Commissioning		**City typically monitors construction and tests to determine compliance with DBFOM Agreement.**
• Construction Period	Contractor	Agreement specifies guaranteed construction period after fulfillment of Conditions Precedent. Notice to Proceed given after Conditions Precedent satisfied.
• Acceptance Test	Contractor	Facility not deemed suitable for commercial operation until test is passed. Testing based on performance criteria set by City. Retest principles outlined in Agreement.
O&M		**City monitors performance via review of records and reports. City may conduct periodic inspections.**
• Operations	Contractor	Contractor is responsible for operating performance and efficiency including labor, chemical usage, and electrical (and all utilities) consumption. Typically, the contractor guarantees the consumption of chemical and utilities while the City is responsible for price escalations.
• O&M Plan	Contractor/City	The Contractor is responsible for submitting on an annual basis an O&M plan detailing O&M activities over the following 1- and 5-year timeframe. The City will review, comment, and approve the O&M plan on an annual basis.

RISK	ALLOCATION	REMARKS
• Inspection	City	The City may inspect the facility and audit facility documentation at their discretion to ensure compliance with contract terms.
• Preventive Maintenance	Contractor	Standard of care provisions and contractual obligations requiring proactive preventative maintenance program.
• Repairs and Replacements	Contractor	Contractor is responsible for all repairs and replacements to meet performance requirements, regardless of costs.
• Efficiency Improvements	Contractor/City	O&M cost savings will be split by the City and contractor. The portion of savings retained by the contractor and by the City will be determined at a future date.
• Capital Improvements	Contractor/City	Contractor is responsible for all capital improvements required to meet performance requirements, except for major improvements where the City may be responsible for costs as a result of a change in law, growth or uncontrollable circumstance. City is responsible for capital improvements as a result of changes to performance standards. Renegotiation principles are included in the agreement.
Financing/Economic		**Payments are set to cover operating and capital costs based on a set schedule.**
• Financing	Contractor	Contractor responsible for financing project.
• Start of Payment	Contractor	City will begin payment at the start of construction.
• Payment Structure	Contractor/City	Payment will consist of the following multiple progress payments: • The City will pay an annual capital charge based on a predetermined capital charge schedule • The City will pay an annual fixed operating charge to cover the cost of labor, fixed O&M activities, and fixed chemical usage based on a predetermined schedule • The City will pay an annual variable operating charge to cover the cost of variable labor, variable O&M activities, and variable chemical usage based on a predetermined schedule • The City will pay an electricity charge. The contractor will be responsible for energy usage based on a predetermined schedule. The City will be responsible for the price of electricity.
• Escalation of Costs	City/Contractor	Contractor holds price until a specified calendar date. Thereafter, price escalates at a percentage of a specified index (i.e., consumer price index, *Engineering News Record*)
• Minimum Payment	City	In the event that the water demand is below the minimum demand, the City will pay a fee to the contractor equal to the variable operating charge for meeting the minimum water demand.
• Financing Changes Prior to Financial Close	City	In the event that changes in market rates occur between submitting a proposal and financial close, the bid price can be changed to reflect the market changes.

RISK	ALLOCATION	REMARKS
Taxation	Contractor	All taxes (i.e., income tax) are contractor's responsibility.
Natural Disaster	City/Contractor	Insurance; renegotiation principles; force majeure provisions. Contractor will provide insurance to a specified limit. City is responsible for risk for amounts above insured portions.
Industrial Relations		
• Labor Transition	Contractor	TBD
• Prevailing Wage Rates	Contractor	TBD
• Strikes	Contractor/City	For local strikes against the facility, contractor assumes risk. For national strikes, City assumes risk.

DBFOM design-build-finance-operate-maintain
O&M operations and maintenance
TBD to be determined

Facility-Specific Risks

RISK	ALLOCATION	REMARKS
Water Treatment Supply and Performance		**City supplies raw water to a set quality to the plant. The contractor supplies treated water to a specified quality to the distribution system.**
Supply of Raw Water		
• Infrastructure (e.g., pipelines, reservoirs, etc.)	City	City is responsible for supplying water to facility site at interface point. Contractor assumes responsibility at the interface point.
• Quantity	City	City is responsible for providing sufficient quantities of raw water in order to enable contractor to meet its obligation.
• Quality	City/Contractor	Specified ranges of quality based on historical data to be provided in DBFOM agreement. Contractor assumes risk for treated water quality within the specified range. City provides relief to treated water quality requirements for raw water quality (additional payment or reduction in quantity requirements) outside of range. Contractual provisions for contractor to justify adjustments to service fees for raw water quality outside of specified ranges.
Regulatory Compliance - **Treated Water Demand**		
• Quality (without Change in Law)	Contractor	Contractor is responsible for supply of specified water quality. Contractual provisions for the need to shut down facility if raw water quality prohibits ability to meet standards.
• Quality (with Change in Law)	City	City typically is responsible for costs associated with upgrading and operating facility to meet new standards.
• Quantity and Flow	Contractor/City	Contractor is responsible for supplying a minimum of XXX acre-feet of water and a maximum of YYY acre-feet of water to the City.
• Infrastructure for Transmission	City	City responsible for installing and maintaining transmission and distribution systems for specified and requested flows.
DBFOM design-build-finance-operate-maintain		